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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/021,079

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Takeshi Hoshida

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12/28/2005

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EXAMINER

TRAN, DZUNG D

ART UNIT

PAPER NUMBER

2638

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/021,079

Applicant(s)

HOSHIDA ET AL.

Examiner

Dzung D Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 and 25-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-19, 25 and 35 is/are allowed.
- 6) ☒ Claim(s) 20-23 and 26-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Specification

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 20, 22, 23 and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grubb et al. US patent no. 6,344,922.

Regarding claims 20, 22 and 23, Grubb discloses in Figure 5b a method for supplying pump light used for Raman amplification in an optical transmission line, comprising:

a first step of supplying pump light having a first optical power to said optical transmission line (e.g., pump λ_{p1} supplying pump light having a first optical power to said optical transmission line);

a second step of detecting optical power of light Raman amplified by said pump light having said first optical power (e.g., controller 34 for detecting optical power of light Raman amplified by said pump light λ_{p1} having said first optical power);

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a third step of supplying pump light having a second optical power to said optical transmission line (e.g., pump λ_{p2} supplying pump light having a second optical power to said optical transmission line);

a fourth step of detecting optical power of light Raman amplified by said pump light having said second optical power (e.g., controller 34 for detecting optical power of light Raman amplified by said pump light λ_{p2} having said second optical power); and

a fifth step of giving a warning about abnormal occurring at a supplying destination of said pump light when a comparison result between detection results of the second step and the fourth step is within a predetermined ranged (e.g., a controller 34 of figure 5(b) centrally setting of the first and second wavelengths through communication lines to the first and second pump light sources, to reduce the gain tilt, wherein the controller controls the setting of the first and second wavelengths in a repeating , sequential order (col. 8, line 67 to col. 9, line 10). Grubb further discloses controller 34 for controlling the pump energy supplied via one or more of the pump wavelength (col. 6, lines 57-66) by detecting or receiving the pumps power and compare it with a desired intensity profile to the optical signal (col. 4, lines 10-17). The controller 34 also transmits supervisory and/or monitoring signal (equivalent to warning signal) to network manager 50 via λ_{sc} (col. 8, line 67 to col. 9, line 10).

Although Grubb does not specific discloses a second optical power larger than the first optical power. However, whether to set a second optical power

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larger than the first optical power or to set a first optical power larger than the second optical power is merely an engineering design choices.

Therefore, it would have been obvious to a person of ordinary skill in the art to set a second optical power larger than the first optical power in order to equalize the power and provide a substantially flat gain over wavelengths of the optical signal.

Regarding claim 26, Grubb further discloses in Figure 5a a plurality of pump light sources (32) located in a respective repeater station of a plurality of repeater stations (26) provided along an optical transmission line between transmitting station and receiving station.

Regarding claim 27, Grubb discloses a controller 34 for controlling the pump energy supplied via one or more of the pump wavelength (col. 6, lines 57-66) by detecting or receiving the pumps power and compare it with a desired intensity profile to the optical signal (col. 4, lines 10-17). The controller 34 also transmits supervisory and/or monitoring signal (equivalent to warning signal) to network manager 50 via λ_{sc} (col. 8, line 67 to col. 9, line 10).

Regarding claims 28 and 29, Grubb further discloses optical transmission line has a Raman gain as a function of wavelength in which an interval between a minimum value and a maximum value of a wavelength of said pump light coincides with a width of an amplifying wavelength band when a maximum value first appeared after a Raman gain generated by pump light starts showing coincides with a center wavelength of the amplifying wavelength band to be amplified (col. 11, lines 14-46), wherein second wavelength is set so that a

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maximum value first appeared after a second Raman gain generated by said pump light with said second wavelength starts showing substantially coincides with a local minimum value first appeared after a first Raman gain generated by pump light with said first wavelength starts showing, on said first wavelength (col. 5, lines 7-19, col. 11, lines 14-20).

3. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grubb et al. US patent no. 6,344,922 in view of Wu US patent no. 6,423,963.

Regarding claim 21, as per claims above, Grubb discloses all the limitations except for stopping means for stopping supply of the pump light when warning is given. Wu discloses a method for shutting off pump radiation from the Raman pump to the fiber (col. 3, lines 13-16), Wu system include a supervisory receiver that provides the output to the decision block 104 for turning off the Raman pump in the event of a failure of supervisory channel source or a cut in fiber (col. 4, lines 51-60). Therefore, it would have been obvious to an artisan at the time of the invention was made to include the teaching of Wu in the system of Grubb. One of ordinary skill in the art would have been motivated to do this for reducing power consumption of Raman pump source and for safety mechanism of Raman pump source. Furthermore, it prolongs the life of the pump.

4. Claims 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grubb et al. US patent no. 6,344,922 in view of Kosaka et al. US Patent no. 6,233,091.

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Regarding claims 32-34, as per claim 1 above, Grubb discloses all the limitations except for an optical signal detector for detecting optical power of an optical signal and a stopper for stopping supply of a pump light when a detection result from optical detector is outside (or higher than) a predetermined fixed range. Kosaka discloses an optical amplifier unit control (figure 42) having optical detector 58 of figure 42 for detecting optical power of an optical signal and a control unit 59, 62 (same as claimed stopper) received a detecting signal from detector 58 of figure 42 compare the power of detecting signal with a predetermined fix range (V_{ref}), for example to see if a detecting signal power is lower or higher or equal a predetermined fix range (V_{ref}) and stopping supply of a pump light when a detection result from optical detector is outside (higher or lower than) a predetermined fixed range (col. 3, line 61 to col. 4, line 13). At the time of the invention was made, it would have been obvious to an artisan at the time of the invention was made to include the teaching of Kosaka in the optical communication system of Grubb. One of ordinary skill in the art would have been motivated to do this since detecting and controlling the pumps' power is well recognize in the art and a detector and stopper of Kosaka offers advantages for stopping a surge power so that it minimize the damage of the light pumps or other down-stream equipments, thus it will be benefit in the optical communication system.

Regarding claims 30-31, as far as examiner understood, Kosaka further discloses an adjustor 40 of figure 30 provided in the repeating station 9 to receive a detection signal that transmit from optical detector 18 (same as claimed

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residual light detector) to said adjustor 40 or control unit 20 (same as claimed stopper). Furthermore, figure 21 clearly shows the adjusting unit 40 is composed of an erbium doped optical fiber 29, a pump source 31 and an optical multiplexer 32 for increasing and decreasing the pumping light from the pump source 31 (see col. 23, lines 10-17).

6. Claims 1-19, 25 and 35 are allowed.

Response to Arguments

7. Applicant's arguments with respect to claims 1-35 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dzung D Tran whose telephone number is (571) 272-3025. The examiner can normally be reached on 9:00 AM - 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye, can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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12/26/2005